

We claim:

1. A pharmaceutical dosage form comprising a plurality of pellets, wherein each pellet comprises:

- a. a pellet core having a diameter within the range of 0.1 to 1.5 mm and comprising tamsulosin or a pharmaceutically acceptable salt thereof, an inert pellet forming carrier, a release control agent and optionally water; and
- b. an outer layer coat surrounding said core which comprises a pharmaceutically acceptable acid-resistant polymer, wherein the mass of said outer layer coat, calculated on a dry pellet core basis, is within the range of 1-25 %; and

wherein the plurality of pellets exhibits a dissolution release profile in simulated gastric fluid using Ph. Eur. basket method at 100 rpm which includes releasing less than 25 % of the tamsulosin or salt thereof during the first two hours.

2. The dosage form according to claim 1, wherein the tamsulosin is a salt selected from the group consisting of tamsulosin hydrochloride, hydrobromide, sulfate, phosphate, acetate, propionate, maleate, fumarate, malonate, lactate, citrate, tartrate, mesylate, and besylate.

3. The dosage form according to claim 2, wherein the tamsulosin salt is tamsulosin hydrochloride.

4. The dosage form according to claim 1, wherein the amount of the tamsulosin or salt thereof in the pellet core is equivalent to 0.05-5.0 mass % of tamsulosin hydrochloride, calculated on a dry pellet core basis.

5. The dosage form according to claim 1, wherein the pellet forming carrier comprises a material selected from the group consisting of microcrystalline cellulose, alpha lactose, dextrin, mannitol, chitosan, and combinations thereof.

6. The dosage form according to claim 5, wherein said pellet forming carrier is microcrystalline cellulose.
7. The dosage form according to claim 5, wherein the amount of the pellet forming carrier is 50-95 mass %, calculated on a dry pellet core basis.
8. The dosage form according to claim 1, wherein the release control agent comprises a pharmaceutically acceptable polymer.
9. The dosage form according to claim 8, wherein the pharmaceutically acceptable polymer is selected from the group consisting of acrylic polymers, cellulose derivatives, and combinations thereof.
10. The dosage form according to claim 9, wherein the pharmaceutically acceptable polymer is a water permeable acrylic polymer.
11. The dosage form according to claim 8, wherein the amount of the release control agent is from 1-25 mass%, calculated on a dry pellet core basis.
12. The dosage form according to claim 1, wherein the content of water in the pellet core is from 2 to 10 %, calculated on a dry pellet core basis.
13. The dosage form according to claim 1, wherein the diameter of the dried pellet core is within the range from 0.3 to 0.9 mm
14. The dosage form according to claim 1, wherein the acid-resistant polymer comprises an acid-resistant acrylic polymer.
15. The dosage form according to claim 14, wherein the release control agent in the pellet core is the same as the acid-resistant acrylic polymer in the outer coat.
16. The dosage form according to claim 14, wherein the outer layer coat comprises 25-75 mass % of the acid-resistant acrylic polymer, calculated on a dry basis.
17. The dosage form according to claim 1, wherein said mass of the outer layer coat, calculated on a dry pellet core basis, is within the range of 2.5-15 mass %.

18. The dosage form according to claim 1, wherein the dissolution release profile in simulated gastric fluid includes releasing less than 15% of tamsulosin during the first two hours in Ph. Eur. basket apparatus at 100 rpm.

19. The dosage form according to claim 1, wherein the plurality of pellets exhibit a dissolution release profile in a phosphate buffer of pH 6.8 using Ph. Eur. basket method at 100 rpm which includes releasing:

10-50% of the tamsulosin in 30 minutes, and/or

25-75% of the tamsulosin in one hour, and/or

more than 70% of the tamsulosin in five hours.

20. The dosage form according to claim 1, wherein the dosage form is a capsule or sachet.

21. The dosage form according to claim 20, wherein the amount of tamsulosin or salt thereof contained in the pellet is equivalent to 0.1 to 1 mg of tamsulosin hydrochloride.

22. A process for making the dosage form according to claim 1, which comprises:

a. granulating a mixture of tamsulosin or a pharmaceutically acceptable salt thereof, a pellet forming carrier, a release control agent, a granulation liquid comprising water, and optionally auxiliary ingredients to form wet pellet cores;

b. drying said wet pellet cores;

c. selecting said dried pellet cores to obtain a fraction within the size range of 0.1-1.5 mm;

d. coating said selected dried pellet cores with a coating composition, which comprises an acid-resistant polymer and which is sufficient to provide said dried coated pellet with 1 to 25 mass % of said coating composition, calculated on the dry pellet core basis.; and

e. drying said coated pellet.

23. The process according to claim 22, wherein the tamsulosin is a salt selected from the group consisting of tamsulosin hydrochloride, hydrobromide, sulfate, phosphate, acetate, propionate, maleate, fumarate, malonate, lactate, citrate, tartrate, mesylate, and besylate.
24. The process according to claim 23, wherein the amount of the tamsulosin salt in the pellet core, is equivalent to 0.05-5.0 mass % of tamsulosin hydrochloride, calculated on a dry pellet core basis.
25. The process according to claims 22, wherein the pellet forming carrier comprises a material selected from the group consisting of microcrystalline cellulose, alpha lactose, dextrin, mannitol, chitosan and combination thereof.
26. The process according to claim 22, wherein the pharmaceutically acceptable polymer is a water permeable acrylic polymer.
27. The process according to claim 22, wherein the content of water in the pellet core after drying is from 2 to 10 %, calculated on a dry pellet core basis.
28. The process according to claim 22, wherein the selection of the pellet core fraction is performed by sieving.
29. The process according to claim 28, wherein the diameter of the dried pellet core is within the range from 0.3 to 0.9 mm.
30. The process according to claim 22, wherein the mass of the outer layer coat, calculated on a dry pellet core basis, is within the range of 2.5-15 mass %.
31. The process according to claim 22, wherein said coating step (d) is performed in a high shear mixer/granulator.
32. The process according to claim 22, wherein said coating step (d) is performed in a fluid bed coater.
33. The process according to claim 22, wherein said coating step (d) is performed on a coating pan.

34. A process for making a pharmaceutical dosage form, which comprises the steps of:

- a. granulating a mixture of tamsulosin or a pharmaceutically acceptable salt thereof, a pellet forming carrier, a release control agent, a granulation liquid comprising water, and optionally auxiliary ingredients to form wet pellet cores;
- b. drying said wet pellet cores;
- c. selecting said dried pellet cores to obtain a fraction within the size range of 0.1-1.5 mm;
- d. coating said selected dried pellet cores with a coating composition, which comprises an acid-resistant polymer;
- e. drying said coated pellet;
- f. testing a sample of said dried coated pellets for dissolution rate in a simulated gastric fluid; and
- (g) repeating the coating process on the remaining dried coated pellets until a desired rate of release is achieved in said testing step (f).

35. The process according to claim 34, wherein the desired rate of release includes less than 25% of the tamsulosin during the first two hours.

36. A method for treating the symptoms of benign prostatic hyperplasia, which comprises administering an effective amount of the pellets according to claim 1, to a patient in need thereof.